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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION



FOREIGN BROADCAST INFORMATION SERVICE

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7 August 1984

WORLDWIDE REPORT

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CONTENTS

ASIA

PEOPLE'S REPUBLIC OF CHINA

Finance Minister Discusses Nuclear Arms (XINHUA, 23 Jul 84)	1
--	---

LATIN AMERICA

INTER-AMERICAN AFFAIRS

Peru Condemns Brazilian Armament, Nuclear Plans (EL COMERCIO, 11 Jul 84)	2
---	---

NEAR EAST/SOUTH ASIA

EGYPT

Closer Examination of Nuclear Power Projects Urged (al-Sayyid al-Nahas; AL-WAFD, 17 May 84)	4
--	---

Briefs Bids on Nuclear Facilities	10
--	----

INDIA

Delhi Asked Not To Build Nuclear Power Plant in Kerala (THE HINDU, 24 Jun 84)	11
--	----

BARC Director Discusses Nuclear Situation, Uranium Enrichment (THE HINDUSTAN TIMES, 16 Jul 84)	12
---	----

Briefs Hyderabad Nuclear Fuel Complex	14
--	----

PAKISTAN

- Columnist Uses Letters To Argue Case for Atom Bomb
(Abdul Qadir Hassan; JANG, 11, 15 Jun 84) 15

Letter Favoring Bomb
Hanif Ramay Letter

SUB-SAHARAN AFRICA

NAMIBIA

- Dumping Nuclear Waste in Country Considered
(THE WINDHOEK ADVERTISER, 22, 25 Jun 84) 19
- Nuclear Waste Plan Scored
AG Denies Cover-up

SOUTH AFRICA

- SA Likely To Have Small Nuclear Arsenal, Expert Claims
(THE STAR, 4 Jul 84) 21

USSR

- Petrosyants on Nuclear Nonproliferation Problems
(A. Petrosyants; PRAVDA, 12 Jun 84) 23

WEST EUROPE

FRANCE

- Excerpts From 1982 CEA Annual Report
(RAPPORT ANNUEL 1982 CEA, 1982) 28

SWITZERLAND

- Upcoming Referendum on Nuclear Power, Saving Energy
(Peter Amstutz; DIE PRESSE, 7 Jun 84) 30

PEOPLE'S REPUBLIC OF CHINA

FINANCE MINISTER DISCUSSES NUCLEAR ARMS

OW230900 Beijing XINHUA in English 0849 GMT 23 Jul 84

[Text] Islamabad, July 23 (XINHUA) -- Pakistan yesterday refuted the Western allegation about China's collaboration with Pakistan in developing nuclear weapons as "totally false" and "baseless." Addressing the current session of the Federal Council, Finance Minister Ghulam Khan said, "In the first place, Pakistan is not engaged in any nuclear weapons program. Secondly, the People's Republic of China has declared that it does not engage in and subscribe to nuclear proliferation."

He said that despite Pakistan's firm commitment to the peaceful uses of nuclear energy, some forces have focused their propaganda against Pakistan. "In doing so," he noted, "these lobbies are evidently trying to deflect attention from countries which are known to possess the capacity to explode nuclear devices." "Surely they are faulty in logic," he added. The minister pointed out that it is a matter of great concern not only for Pakistan but for the Third World as a whole that certain advanced countries have sought to monopolize technologies and adopted a policy of denial and discrimination towards the developing countries.

Ghulam reiterated that Pakistan seeks to develop nuclear energy solely for peaceful purposes, for promoting its industry and agriculture and, above all, for enabling the country to acquire a degree of self-reliance in the field of energy.

CSC: 5100/4134

PERU CONDEMNS BRAZILIAN ARMAMENT, NUCLEAR PLANS

Lima EL COMERCIO in Spanish 11 Jul 84 p A2

[Text] Once again, undenied international journalistic reports speak of Brazil's nuclear projects. In effect, statements given by physicist Luiz Carlos Menezes to a Spanish wire service indicate that the Brazilian military forces are bent on the construction of an atomic bomb.

This accusation coincides with similar ones made by Professor Luiz Pinguelli, of the federal university of Rio de Janeiro, and by researcher Rogerio Cezar Cerqueira, who assert, according to issues of the daily FOLHA DE SAO PAULO, that Brazil "is studying means of obtaining technical capability for the production of nuclear arms and it is a sophism to say that it is not making efforts to build them" and that "they have not yet achieved the final objectives of technical difficulties."

Meanwhile, still according to accounts which are not officially denied, it is known that the Amazonian nation's navy reportedly is trying to produce a nuclear-powered submarine as soon as possible, and that the air force is carrying out identical experiments in the Aeronautical Technology Center (CTA). For such purposes, both branches reportedly rely on a large group of officers and technical specialists trained abroad.

All this results in an extremely serious situation, because it implies the use of enormous sums of money and other resources for reprehensible ends, at the very time that the Brazilian populace itself is passing through an economically critical period. And because Brazil—through its technological advances in the field of conventional arms, of which it is the sixth most important exporter in the world—is achieving a new privileged status in Latin America, especially in the Amazon basin, which brings about, beyond a doubt, a dangerous alteration in the regional strategic balance.

Therefore, encouraging an even greater growth of Brazilian war potential, especially on the part of the United States, can be interpreted as simultaneously fostering a pernicious South American arms race, besides strengthening the military rulers, under questioning for their refusal to return democracy to the nation.

If one recalls that the majority of our countries is signatory to the nuclear arms nonproliferation Treaty of Tlatelolco, we consider that it is up to Brazil to observe strict respect for the vital necessity of preserving Latin American security. Instead of throwing itself into armament adventures, it is much more positive, we are certain, to strengthen regional relations through programs designed to surmount peacefully the structural crisis that weights on us.

CSO: 3348/493

CLOSER EXAMINATION OF NUCLEAR POWER PROJECTS URGED

Cairo AL-WAFD in Arabic 17 May 84 p 8

[Article by al-Sayyid al-Nahhas: "Nuclear Power Plants Project: The People Must Discuss It Before It Is Begun"]

[Text] This important project does not concern our party alone. In fact, it concerns every Egyptian of this generation and the next 10 generations.

While the United States is withdrawing from the continued construction of nuclear power plants because of the exorbitant costs and constant dangers, and while the people of Europe, America, and Asia are revolting against such projects, the Egyptian administration, the government of the ruling party, insists on carrying out such a dangerous project.

Egypt's economy cannot currently bear such projects and we cannot bear, in the future, to be under the control of countries that export the fuels for these power plants.

For these reasons, we demand that this important matter be studied further, and be raised with the people at all levels. We demand this now, before the government embarks on this project next month.

Before I begin to deal with the basic points with the fewest possible words but the greatest possible evidence, and as succinctly and briefly as possible for such an important topic, it is necessary to first clarify some preliminary points.

First, the issue of constructing nuclear facilities is a national issue in every sense of the word. In fact, it is among the greatest and most significant of national, economic, and political issues in the history of Egypt. On the national level, the issue must be raised in its entirety before it is irrevocably begun in June. This important issue, which does not concern one party above another or one group above another, must be treated in a spirit of nationalism, because it concerns all of Egypt and her current and future generations.

Egypt and the people of Egypt--all of its individuals, parties, political and economic leaders, its thinkers, scholars, and experts--must not be driven

blindfolded into the institution and implementation of a project of this immensity, this cost, and with these dangers.

All of Egypt has a right to know, all of the Egyptian people have a right to know, and the opposition--because it is constitutionally one of the governing partners--has a right to know, before a final decision is made and irreversible work has begun. This is a multifaceted project. It has economic, financial, political, health, social, and technical aspects, and it is not right for a committee of the Ministry of Electricity, regardless of our respect for its chairman and members, to monopolize this project.

Second, I am committed to national methods and discussion at the national level, and I have not hesitated to reaffirm the writings of other senior journalists of nationalist newspapers who have attacked the nuclear power plant project, even though their criticisms have been weak, gentle, and distant. Their echos have faded and disappeared in the wind.

Why Did al-Sadat Halt the Sidi Karir Plant?

The fourth [as published] preliminary point which must be made, and I consider it a worthwhile starting point for the main topic, is my connection with the subject of nuclear reactors. It began with my close friendship with the late Dr Muhammad Fu'ad Hilmi, the former governor of Alexandria who led the Alexandrian people during President al-Sadat's era against the construction of the first nuclear reactor in the Sidi Karir area west of Alexandria. He used to keep me informed of each development in the matter. He gave me complete copies of dozens of documents and studies which he tried very hard, may God have mercy on him, to collect. He gathered, in particular, those published in Western countries that have preceded us by dozens of years in experimenting with nuclear reactors. At the head of this list is the United States, which preceded the entire world in this field, and which recently decided, in light of its experimentation, to stop construction of nuclear power plants, while working to rescue the companies that build these plants by finding other markets for them in the Third World.

Now let's return to the Sidi Karir reactor, and how the opposition of the people of Alexandria, headed by the late governor Fu'ad Hilmi, succeeded in prevailing upon President al-Sadat to abandon construction of the reactor in the area of Sidi Karir and change the building site. The news was published in the 22 June 1979 issue of AL-AHRAM under the headline "President Orders Change in Site of Sidi Karir Nuclear Reactor." It reported President al-Sadat's request to Alexandria governor Dr Fu'ad Hilmi to change the site of the nuclear reactor, which was scheduled to be built in the area of Sidi Karir west of Alexandria, because of the damage it would cause to the surrounding environment. It was ordered moved to some other remote place where it would not pose a danger to the local populace or environment.

A literal quote from what was published in AL-AHRAM says, "The Governor of Alexandria announced this in yesterday's local council session." The council agreed unanimously to move the nuclear reactor facility from this location, and issued the following recommendation on the matter:

"In consideration of the resolution concerning Egypt's first nuclear power facility located between kilometers 29 and 34, and 4 kms deep into Sidi Karir west of Alexandria, and in light of the recently revealed dangers that this facility poses, the council believes it necessary to find an alternative to the energy that would be provided by this facility, such as the exploitation of the gasses of Abu-Qayr, which have been discovered and which will produce 600 megawatts of electricity."

Why Did Sweden Stop Reactor Construction?

An article on the same page of AL-AHRAM, under the headline "American Bubble Stops Reactor Construction," referred to the American nuclear reactor accident at Three Mile Island and the leakage of nuclear radiation from it. Also on that page of AL-AHRAM came the following news:

"Sweden has cancelled a project for the construction of seven nuclear reactor facilities and has decided that the six reactors currently operating are sufficient. Sweden supplies its electricity needs with the great number of waterfalls that it has. The decision was brought about by the formation of the huge bubble in one of the nuclear reactors in America. This led to a wave of fear among the Swedes, and to debates in parliament. Some of the deputies argued for abandoning existing reactors, and for relying on waterfalls alone for generating electricity."

The construction cost of the nuclear reactors project is hundreds of times the construction cost of the Aswan Dam. Nonetheless, resolutions were issued and passed concerning the project in near silence during the administration of the late President Anwar al-Sadat.

Some may think that this estimate goes beyond the limits of rational thinking, is an intimidation and an exaggeration, but it is the bitter truth that we must now face in astonishment and shock, so that we can later face up to the horror of the shock.

It will be enough here for us to read together what was published, as these lines were being written, on page 8 of the 4 May issue of AL-AHRAM quoting Dr Mahir Abazah, the minister of electricity and energy. Following is a literal quotation:

"Dr Engineer Mahir Abazah, minister of electricity, says, concerning the nuclear power program, that it has become essential to build eight nuclear facilities along the northern coast that will fulfill 40 percent of our electricity needs by the year 2000. Each facility will produce about 1,000 megawatts of electricity. They will be linked with a high voltage grid. The execution of this program will take 8 years, and the financing for these facilities will come from a special fund, which has already had \$700 million put in it from oil revenues, and easy term loans from international financing organizations."

It is clear from what Engineer Mahir Abazah said that the nuclear reactor construction project or plan in Egypt is scheduled to consist of eight

reactors or nuclear facilities. Here we must compare the Egyptian Ministry of Electricity investment cost estimates with the actual costs that have been realized in those countries that have preceded us in the construction of nuclear reactors. It has been irrefutably proved that although contracts are awarded at a certain price, that price is multiplied in the contract implementation and reactor construction period, which takes almost 10 years for a single reactor.

It is useful to note what the minister of electricity told me about costs and what the editor-in-chief of AL-AHRAM said about the experiment in the Philippines. In a meeting with friends a few weeks ago in the home of my good friend Ahmad Abazah, the head of the Abazah family and a member of the Wafd party's Higher Authority, I heard from Minister of Electricity and Energy Engineer Mahir Abazah that he estimates the cost of constructing one reactor at about \$1.2 billion. We can compare this with what the editor-in-chief of AL-AHRAM, Salah Muntasir, said on page 8 of the 19 April 1984 issue under the headline, "Nuclear Facilities."

Given the importance and significance of what the editor-in-chief of AL-AHRAM said, allow me to quote, "...In the Philippines they have based their plan on the construction of nine power plants, including four to be built in the first 5-year plan. They began, as is customary, the construction of one plant, which was estimated to cost \$440 million. Although the plant is still not finished, the cost has jumped to more than \$2 billion, or about five times the original estimate."

"The second point is that with every month that passes the prices jump. The contracting companies begin a 180 degree turnaround. They sign a contract and then begin construction so they are locked in to the project, then they begin to voice their demands for more money."

"The third point is that even if the agreements contain a thousand and one conditions to prevent price increases, it often happens, in fact it always happens, that during construction modifications are encountered. The smallest of modifications, even if it is merely the addition of a nut and bolt, results in a tremendous cost imposed by the company, which, of course, will be one of very few companies in the world that monopolize these projects."

"As a result of all this, they told me in the Philippines that they will make do with the construction of only one plant, and repentance."

One of the most important investigative stories of the 20th century exploring the subject of nuclear reactors was published in 12 pages of TIME magazine. The first two pages carried a large picture of the Diablo Canyon reactor in California with a caption saying that the original cost of this project was fixed at \$450 million, but that the actual cost had risen to \$4.4 billion, or 10 times the original estimate, and, in addition, there were construction delays.

This report reveals that in some cases the cost of a single reactor has risen to as much as 5, 6, and 7 billion dollars.

It is clear, then, from the above, that my estimate for a cost 100 times that of the Aswan Dam for the eight reactors scheduled for the Egyptian nuclear power program is an estimate based on reality, on the truth, and on facts, not on imagination.

After this, could we overcome our disgrace? Will these amazing facts of what has actually resulted from the experiments of other countries serve as a warning to us?

Egypt's Financial Condition: Can It Bear the Reactors?

Here we ask, "Can Egypt's financial and economic condition, which President Husni Mubarak stated clearly in his May Day speech, and the status of its resources, expenditures, and loans bear the costs of nuclear reactors?" What do Egypt's economic and financial experts say?

These costs and burdens are being avoided by America, the richest country in the world, the most advanced, the one with the most resources and wealth. The main reasons why America and other countries have stopped building reactors derive from their experiences with the reactors they have built and tested for the past decades. Other primary reasons include America's weariness with managing, maintaining, and operating these reactors, the tremendous health hazards posed to this and future generations, and the many accidents that have occurred in numerous reactors--as mentioned in the TIME report, a report submitted to the U.S. congress, and an important report on the evil consequences of building reactors in Brazil in the absence of democracy.

The complete cessation of construction of reactors in some industrial countries--the foremost being America--and the reduced number of reactors in other countries are linked to the effort to rescue the nuclear reactor industry and the companies that build reactors by finding other markets for them in developing countries such as Brazil, Argentina, the Philippines, and countries that suffer a severe shortage of sources of electric power and no substitutes, such as China.

Will we permit Egypt to be one of the customers or victims? Will we overburden Egypt with the costs, troubles, and foreign loans?

Why has the Egyptian Ministry of Electricity closed its eyes as though it were blind and its ears as though it were deaf to new developments and changing circumstances of nuclear reactors, to the new positions announced for the whole world to hear, and to the studies and investigations that have been published?

Is this silence the best response, while clinging stubbornly to a position? What will be the impact on the implementation of the nuclear program that was drawn up 7 years ago during President al-Sadat's administration with the first bidding set to start next month?

Does this legislation, which has the force of law, coincide with constitutional, economic, and sound financial principles? It was issued 4 years ago

during President al-Sadat's era and passed lightning-quick through the People's Assembly in hours with \$500 million annually of Egyptian petroleum income allocated to the nuclear reactors project.

Egypt Rich With Petroleum Power Resources

The proverb says, "One who is forced rides adversity." Egypt, praise God, is not forced to ride adversity. It has numerous and plentiful sources of electric power that are capable of sustaining growth and development. This comes from the statements and resolutions of concerned ministers, the minister of electricity and power in particular.

In an interview with AL-AHRAM on 4 May, Engineer Mahir Abazah said, "The first firm strategy has been drawn up for the production of electric power between now and the year 2000. Our estimates are that electricity consumption in Egypt will rise from 32 billion kilowatts at the end of 1984 to 105 billion kilowatts at the end of the year 2000. The strategy calls for the production of electric power to be distributed as follows: 20 percent to be generated by burning petroleum derivatives, 10 percent from coal, 15 percent hydroelectric power, 40 percent from nuclear power, and 15 percent from power plants burning natural gas."

It is clear that the numbers mentioned by the minister of electricity and power are merely estimates that are subject to reconsideration. The percentages he stated for the breakdown of power production by source did not include any percentage for solar and wind power. The national duty requires that Egypt avoid the woes of nuclear reactors and supply its growing requirements with the numerous other sources of power. By way of example, it has been determined that solar power—and Egypt is rich in sunshine—will become, within the 10 years required to build each nuclear reactor, more economical and beneficial than these reactors themselves.

We have no doubt that Egypt's government and people are conscious of the energy future in Egypt. Here it is worth noting President Husni Mubarak's statement published on the front page of the 22 February 1984 issue of AL-AHRAM. The article stated, "In the field of energy, President Mubarak has shown a strong interest in expanding the use of solar power to replace other sources of energy."

From the standpoint of the opposition, Vice Chairman of the New Wafd Party Dr Wahid Ra'fat wrote the following on page 7 of issue 6 of AL-WAFD published on 26 April 1984:

"How is it possible that we live in a country with bright sunshine during all four seasons and we do not exploit to the fullest this awesome solar power, which God has granted us, to ease the pressures on other sources of heat energy, including nuclear power, which is not devoid of risks?"

We implore the president of the republic, the prime minister and members of the cabinet, and the minister of electricity, in the name of the higher national interest, the spirit of nationalism, and in light of the climate of democracy that the country is currently experiencing, to delay the start of bidding for the nuclear reactors and to restudy this great and dangerous matter on the national level.

BRIEFS

BIDS ON NUCLEAR FACILITIES--Minister of Electricity Engineer Mahir Abazah has announced that in July the best bid from among American, French, and German bidders will be chosen for the construction of the first nuclear power plant for peaceful purposes. Ground will be broken in October for the project which will cost about 2 billion pounds and which will comprise two units producing 4,000 megawatts of electricity per year. During ceremonies yesterday for the opening of several projects aimed at strengthening the electricity network in the villages of Bandaf, Abu-Tawalah, Mayt Yazid, and Kafr al-Dayr in al-Sharqiyah Governorate, the minister said that the first solar power generating plant will be opened before the end of this year. The plant was built with French participation in 10 Ramadan city. [Text] [Cairo AL-AHRAM in Arabic 24 May 84 p 8] 12608

CSO: 5100/4602

DELHI ASKED NOT TO BUILD NUCLEAR POWER PLANT IN KERALA

Madras THE HINDU in English 24 Jun 84 p 13

[Text]

COCHIN, June 23.

A resolution requesting the Centre that it drop its proposal to establish a nuclear power plant in Kerala was unanimously adopted at a day-long seminar held here today under the auspices of seven organisations led by the Organisation for Protection from Nuclear Radiation.

A memorandum, signed by about 200 delegates, to be presented to the Prime Minister, referred to the proposal for setting up of a nuclear power plant at Bhoothathankettu on the northern bank of the Periyar near Kothamangalam.

It said that because of the very high density of population in Kerala, the hazards to the people and the environment from the radiation during the normal working of a nuclear plant as well as from possible accidents would be far greater than in other places. If a nuclear plant was established at the proposed site it would also be in violation of the site selection criteria stipulated by the International Atomic Energy Agency.

Another point was about the proneness

of the site to tremors and landslips as had been evidenced by the recent landslips near the Idamalayar dam (power project), which was less than five km from Bhoothathankettu.

The natural radiation in Kerala (400 milli rems) was more than four times higher than in the western countries and that cancer death rate here was 13 times higher than in any other State in the country, the memorandum pointed out.

Mr. V. R. Krishna Iyer retired Supreme Court Judge, who inaugurated the seminar "on the advisability of an atomic reactor in the State", said he had reservations about a nuclear power plant being established in Kerala. For one thing the plant, on which some Rs. 2,000 crores would have to be invested, would not have much job potential for Keralites and for another, the State had a very high density of population. He also doubted whether the country had achieved enough technological progress to control hazards from nuclear power plants.

Public welfare should be the touchstone for implementation of such projects. The people of the locality where they were to be established should be consulted, he said.

CSO: 5150/0030

BARC DIRECTOR DISCUSSES NUCLEAR SITUATION, URANIUM ENRICHMENT

BK220306 Delhi THE HINDUSTAN TIMES in English 16 Jul 84 pp 1, 5

[By Rajendra Prabhu]

[Text] New Delhi, July 15 — The Bhabha Atomic Research Centre (BARC) "will not let down the country" if it needs uranium enrichment, according to BARC Director P.K. Iyengar.

Dr Iyengar was replying to a specific query during an interview with him in his office in Bombay recently, whether in a situation where India may need to go in for uranium enrichment, one could count on one's own research and development to come to the country's aid.

"Our R&D knows what is involved," Dr Iyengar said, pointing out that BARC's capabilities had been demonstrated by the fact that it has mastered the fuel cycle that would enable the country to extend its nuclear fuel resources manyfold. He explained how BARC had developed such frontier processes like reprocessing of plutonium from spent fuel, use of a plutonium-uranium carbide fuel in fast breeders, and lately the conversion of thorium into a uranium isotope U-233 and its utilisation as a nuclear fuel.

"India is one of the few countries, particularly in the developing world, that have the know-how of the fuel cycle," Dr Iyengar added. With this, its uranium and thorium natural resource could be made use of repeatedly in suitable reactors to release energy and generate power.

On the question of uranium enrichment, Dr Iyengar said: "The question is only of industrial scale transformation and installing facility which generally takes five years. "Even though enrichment is not in our line, we should pursue it even though light water reactor may not be economical. Crux of the problem is enrichment. If it is cheap, then light water reactor which has certain advantages becomes more economical." "We should keep watching the situation," Dr Iyengar replied when asked what should be the Indian choice.

Explaining how BARC had kept itself far ahead of the country's requirements in nuclear matters, Dr Iyengar said that a decision to acquire the technique of reprocessing spent fuel to obtain plutonium was taken in 1958 and the first plutonium plant came up in 1964. This had enabled us to have our own reprocessing and

plutonium extraction plants without any dependence on foreign technology. A larger reprocessing plant is now working in Tarapur and another is under construction at Kalpakkam near Madras.

Yet another technological breakthrough was the use of thorium as nuclear fuel. While uranium resources in the country might not exceed 60,000 tonnes at best, we have an already discovered base of five lakh tonnes of thorium in Kerala and Orissa alone and more was likely to be discovered. The BARC succeeded in converting the non-fissile thorium into fissile U-233 which is again a rare feat. "We put thorium in Cyrus reactor in Trombay to get U-233," Dr Iyengar explained giving its details. "We then reprocessed the thorium to extract the converted U-233 from it. Even though it is similar to plutonium, it is also toxic, emitting considerable gamma ray radiation. We got this U-233 and did some experiments for understanding its physical structure."

A new reactor Purnima-II was used for this study of U-233. This isotope of uranium does not exist in natural state but is the most fissile among the three isotopes of uranium. U-233 in a reactor could be used to produce plutonium and emit heat which could generate power, and plutonium in turn could be reused as a fuel thus completing a cycle, each chain in which would generate fuel for the next chain.

In an exciting experiment at the Reactor Research Centre at Kalpakkam, BARC will be testing out its U-233 using a high neutron flux of the fast breeder to do its radiography in a small equipment named "Kamini" lowered in the reactor vessel of the Fast Breeder Test Reactor [FBTR] there which is nearing completion. All this is in preparation for using U-233 in the third generation reactors of future. The BARC has perfected the mixed plutonium-uranium carbide fuel for the FBTR and the first fuel rods are ready for shipment to Kalpakkam. The FBTR would open up the series of 500 MW fast breeders of the next decade, the second generation reactors in the fuel-cycle.

The development of the plutonium-uranium carbide fuel by the BARC has helped India free itself from any dependence on the highly enriched uranium fuel for this FBTR which France had promised but was unwilling to undertake. In the process, the FBTR now would be free of any obligation of being inspected by

the International Atomic Energy Agency. The Atomic Energy Commission apparently hopes to protect and further our nuclear independence. The thermal reactor at Kalpakkam, the first unit of the Madras atomic power project as it is known, is the second facility in the country beyond the prying eyes of international inspection (the first being the Cyrus reactor at Trombay).

The BARC is going to help zealously protect this independence and self-reliance. Dr Iyengar said that the FBTR would use only the plutonium extracted from the spent fuel of Cyrus which is not under international inspection. As for the plutonium from the two nuclear power plants under international inspection, namely the Tarapur and Rajasthan nuclear power plants, a new scheme is being evolved.

Under the new scheme, the BARC had developed the technology to put the plutonium generated in the spent fuel in these two projects, back into these very reactors to obtain the second generation fuel for them. This was the MOX fuel, the development of which made the international nuclear community to sit up and take note of India's capability. With MOX in which plutonium replaced U-235 for "enrichment" of natural uranium, an indigenous fuel could replace the imported fuel for the Tarapur plant. Even though imported fuel is now assured, the BARC is looking upon a time in the near future when MOX would replace this fuel in the reactor.

The plutonium extracted at present from the spent fuel rods at Rajasthan Atomic Power Plant (RAPP) would be converted into MOX to be used in the same plant at a later stage. The BARC also further plans to use thorium as part of that fuel to obtain U-233. "RAPP can use plutonium as fuel," says Dr Iyengar, thereby opening an entirely new chapter in the further extension of India's natural uranium resources even in thermal reactors. "If you put one to two per cent plutonium in natural uranium, then it lasts longer (as a fuel)."

CSO: 5100/4738

BRIEFS

HYDERABAD NUCLEAR FUEL COMPLEX--Hyderabad, June 26 (UNI)--The nuclear fuel complex (NFC) here has, for the first time in the country, produced seamless titanium tubes of 25.44 mm thickness. Dr N Kondala Rao, chief executive of the NFC, said the technology used for this purpose was one developed at the NFC for the production of seamless zirconium tubes. The possibility of indigenous production of titanium tubes was established yesterday with a successful trial production at NFC. Titanium tubes, widely used in condensers, power generation, chemical industries and space programmes, were being imported till now. Dr Rao said the trial production proved that NFC could undertake production of titanium tubes on a commercial scale and even for export. He said the NFC had set up an eight crore rupee extrusion plant with a capacity of 20,000 tonnes. The plant, which had been producing stainless steel tubes, zirconium tubes and ball bearing tubes, could now produce titanium tubes as well.

[Text] [New Delhi PATRIOT in English 27 Jun 84 p 5]

CSO: 5150/0031

COLUMNIST USES LETTERS TO ARGUE CASE FOR ATOM BOMB

Letter Favoring Bomb

Karachi JANG in Urdu 11 Jun 84 p3

[Abdul Qadir Hassan column "Non-Political Affairs: "Yours Truly, the People of Pakistan"]

[Text] A straightforward and honest Pakistani brother has expressed his feelings about atom bombs without any ambiguity in a straight forward manner. Free from political and diplomatic expediency, this Pakistani is amazed and bewildered about what is preventing us from producing an atom bomb if we can really produce one and what we are waiting for. If we have produced an atom bomb, then why are we afraid and why do we not say so openly to the world. This Pakistani's letter is tantamount to a letter from all Pakistanis. This letter represents the feelings of all Pakistanis, but it bears the name of one Pakistani, though in another sense it bears the signatures of 85 million Pakistanis or, to be more specific, those of 100 million Muslims. Consider it your own letter, which has been given the power to express your feelings, and at the same time pray to God that he may end our helplessness. No government can dream of a bigger honor and no Pakistani can think of a better reason for joy and happiness:

"Recently you published a letter about the atom bomb in your well-known column 'Non-Political Affairs'. I am grateful to the creator of the universe that you took up Pakistan's most important problem.

According to you and respected Dr Abdul Qadir Khan, producing an atom bomb is a political decision that is up to the government in power. Mr Hassan, after Quaid-e Azam can you tell me of any government that made important political decisions in the proper manner whether it was a military or a civilian government? The people believe that important decisions are always made under foreign pressure.

"Mr Hassan, you have always been telling me that we should develop agriculture, investment and commerce and trade; build factories, schools and hospitals; and build beautiful and idyllic roads and parks. But how can I do all this wholeheartedly when I am not sure whether I will be able to enjoy all these things? You may tell me a hundred thousand times but I do not believe that this country will survive. Why should I do all this for some other nation?

"For doing all this, you will provide me with loans and resources from outside. I will embezzle some of the money and deposit it in my personal account in some safe foreign country where I can flee to rest and live in peace when trouble comes.

"If the government does not have enough funds to produce an atom bomb, let it appeal to the nation for donations. God willing, the government will not have to face frustrations. Let them take half my salary. The people will gladly bear hardships and accept 10-hour electricity outages instead of 4. The people are not satisfied with 40 F-16s and they never will be. If the government wishes to hold a referendum on some important political proposal, then it should hold one on producing atom bomb.

"If we produced one atom bomb today, investment would start pouring in the very next day. People will start working zealously and our neighbors will come to their senses. Otherwise, as the Pushto saying goes, 'the Hindu has become tired of praying, but God still remains displeased.' However much Gen Ziaul Haw may try, Indira Gandhi will sign neither a peace treaty nor a treaty of friendship.

"Why are so many crimes and robberies taking place in Karachi, Lahore and Islamabad in broad daylight? This is because they know very well that the people whose houses they intend to rob are not in a position to defend their homes adequately. Why aren't such incidents taking place here in the Frontier [Province]? Simply because the people here have much better and stronger weapons. Pakistan's position is exactly the same. Everyone threatens us and tries to put pressure on us.

"I hope that you will start a powerful campaign in this connection, or in other words, Abdul Qadir Hassan of Islamabad, go quietly to Dr Abdul Qadir Khan and ask him to make an atom bomb quietly and after producing it to say so. His personality is such that no one can do anything against him."

With regards, yours truly,

Mian Tahsinullah Jan, Charsadda, Frontier Province.

You read this letter. Though there is no room for comment, in the end I apologize to Pakistanis who may have been inconvenienced by reading this letter and to the frustrated Pakistanis who have been deprived of their traditional Islamic qualities of courage and valor.

Hanif Ramay Letter

Karachi JANG in Urdu 15 Jun 84 p 3

[Abdul Qadir Hassan column "Non-Political Affairs": "Hanif Ramay and the Atom Bomb"]

[Text] After I recently quoted in this column a few lines from well-known Pakistani scientists Dr Abdul Qadir Khan's statement on an atom bomb, it appears that readers were expecting a flood of letters on the subject demanding

that Pakistan set forth and make an atom bomb at once. We can at the most wage an atomic war with our pens. The real bomb will be used either by Dr Abdul Qadir Khan or President Ziaul Haq. But impatience has reached such heights that Hanif Ramay wants the bomb to explode the moment his letter is published. Would to God that Hanif Ramay's desires are fulfilled. But just now we present the blast of his letter.

"Dear Brother Abdul Qadir Hassan,

"You recently started a discussion which is so close to my heart and my mind that I cannot help indulging in it. Right from the beginning my stand with respect to the atom bomb has been that if we can make an atom bomb we might as well make it as soon as possible. But my position is not militant. It is based on peaceful designs. In proof of my claim I have three kinds of evidence: religious, historical and material.

"1. There is no doubt whatsoever that the most merciful, most forgiving and loving God ordered that evil should be suppressed with virtue. But when an adversary is bent on doing evil, then the same merciful God who also possesses the power of retaliation and chastisement has given clear and unambiguous orders to fight and wage war against the enemy. In this connection, God decrees that we should be so prepared and alert that the sound of the hooves of our horses should instill terror in the hearts of our enemies.

"2. God sent Holy Prophet Mohammad as the divine blessing of the universe. The prophet, who was the embodiment of divine mercy and kindness, had to fight against 'bu-jahals' and 'bu-lahabs' [Abu Jahal and Abu Lahab were the uncles of the only prophet and were his bitter enemies; thus, these terms are used in general for enemies of Islam], bitter enemies of Islam in the war of Uhd, because sometimes only war can be a guarantee of blessing. Not all wars guarantee blessings, only those that bring about domination of good forces over evil, because without domination of good forces 'shahadat', i.e., martyrdom, can be attained but not victory, which is an other name for God's blessings.

"3. An atom bomb was used when the United States was the only country that possessed this weapon, about 40 years ago. But no atom bomb has been used since the United States ceased to have monopoly over it and the Soviet Union, Britain, France and China also acquired this weapon. The United States, despite its extreme desire and urgent need, could not use it in Vietnam. Today the proliferation of atom bombs has in itself become the biggest barrier to its use. If this is a fact, then one is forced to wonder why the spreading of atom bombs in the Islamic world is being restricted.

"4. Israel, which is a splinter in the heart of the Muslim world, possesses the atom bomb. Similarly, it is now 10 years since India made its first atom bomb. In the whole world making an atom bomb is considered a criminal act only for the Muslim world and Pakistan, and they are forbidden to make this weapon. The reason is simple enough. If Muslim countries were to start making atom bombs, then their dependence on conventional weapons made and sold by factories in the United States and at their own prices, would face a great loss. We must change this situation by making atom bombs. As long as we remain dependent for our defense on foreign powers we cannot achieve political and economic freedom.

"5. Pakistan wishes to live in peace with all of its neighbors. We wish to live in peace even with India, but it should be an honorable peace on the basis of equality, not a position politically and economically subservient to India. We extended our hand of friendship to India time and again, but every time we received a cold shoulder. Only recently, for the first time, was some warmth shown, and people who really know, how that this warmth will last only as long as India is faced with the Sikh crisis. If we wish to have long-lasting peace with India, then we will have to bring our defensive system on the same level as that of India by making atom bombs. I can tell you in writing that on the very day after Pakistan makes an atom bomb India will extend its hand of friendship to us, and it will not be hypocritical then as it is today.

"6. The United States and Israel have been calling Pakistan's atomic program the Islamic bomb right from the start. The fact is that on the very day that Pakistan acquires this weapon, Israel's aggression will be curbed. Pakistan will have to accomplish this task if not for itself then for the sake of the Muslim world. There is always the risk, of course, that Israel, just as it did in the case of Iraq may attack our atomic installations. Even the United States will be displeased at us for daring to make this weapon. But at this time, Israel has its hands full with Syria and the United States is involved in the Gulf crisis. Taking advantage of this situation, we should try to accomplish this task immediately, without delay. I sincerely pray that the atom bomb blast takes place the very moment your column is published."

Yours sincerely,

Mohammad Hanif Ramay

9315

CSO: 4656/167

DUMPING NUCLEAR WASTE IN COUNTRY CONSIDERED

Nuclear Waste Plan Scored

Windhoek THE WINDHOEK ADVERTISER in English 22 Jun 84 p 3

[Text]

MR JANNIE DE WET, member of the Executive Committee in the white ethnic assembly, has come under widespread flak for suggesting nuclear waste be dumped in Namibia.

A proposal earlier this week by Mr De Wet, who represents the National Party of SWA in the White Legislative Assembly, that an investigation be launched into the dumping of nuclear waste, has been rejected by the Ad-

ministrator General's office and Nature Conservation.

A spokesman for the AG's office said today:

"We do not intend getting involved," and added "the AG does not intend negotiating along the lines proposed by Mr De Wet."

The Deputy Director of Nature Conservation, Dr Piet van der Walt, said his department "was not prepared to support Mr De Wet's proposal".

"We are totally against it", Dr Van der Walt added.

Mr De Wet said there was a lot of income to be

earned by using parts of western Namibia as a dumping ground for nuclear waste.

Mr De Wet did, however, add that it was up to the people of Namibia to decide.

AG Denies Cover-up

Windhoek THE WINDHOEK ADVERTISER in English 25 Jun 84 p 3

[Text]

THE OFFICE of the Administrator General has denied it is trying to suppress news of a plan to dump nuclear waste in desert areas of the country for R1 billion a year.

A Johannesburg Sunday newspaper, The Sunday Express, reported yesterday the news clampdown was lifted later amid a welter of statements denying the plan was being considered.

The proposal to dump nuclear waste for America and Germany in Namibia - possibly in the

north-western area of the Kaokoveld - was raised in the White ethnic Assembly last Wednesday by the MEC of the Executive Committee, Mr Jannie de Wet.

Mr De Wet urged the plan should be publicly debated.

But so far Mr De Wet has not received support for his plan from any quarter - only flak.

The Express said the

AG put a clamp on reports by the SWABC, in Die Republiein and Die Suidwester newspapers.

The Press Liaison Officer for the office of the Administrator General, Mr Fanie Pretorius, said: "We do not intend to get involved in any plan to dump nuclear waste in this country and there will be no negotiations with anybody".

He said it was untrue the AG tried to put a clamp on the story.

"I did ask the newspaper concerned and the SWABC not to sensationalise the story as it is an emotive issue, but there was no pressure put on them; it was merely a friendly request when they contacted us for comment.

"As for Die Suidwester, they did not even ask for comment on the story.

"On Friday Die Republiein carried the story of Mr De Wet's suggestion as its front page lead story, as did Die Suidwester.

"The Editor of Die Republiein, Dr Jan Spies, could not be contacted for comment yesterday.

The paper's News Editor, Mr Philip Deetleefs, said he was not on duty last Thursday or Friday, but as far as he knew there was no pressure to stop the story being printed.

While making his suggestion, Mr De Wet said Namibia could earn more than the total Budget of the Central Government if it agreed to establish a dump for nuclear waste from the US or Germany.

Mr De Wet said he and the Exco Chairman of the White Legislative Assembly, Mr Kosie Pretorius, had recently been approached by SA businessmen representing a major foreign business group with the proposal.

The AG's media spokesman, Mr Pretorius said Mr Kosie Pretorius and Mr De Wet had spoken to Dr Van Niekerk about the plan.

"But I can say emphatically the Central Government has no plans for negotiations on the dumping of nuclear waste and the Administrator General did not try to intervene to suppress news reports on the matter".

Even if the White Assembly itself agreed to such a plan it would not have the power to implement.

During his speech Mr De Wet said it was up to the people of SWA to decide.

The Deputy Director of the Department of Nature Conservation, Dr Piet van der Walt said: "We are totally against Mr De Wet's proposal".

SA LIKELY TO HAVE SMALL NUCLEAR ARSENAL, EXPERT CLAIMS

Johannesburg THE STAR in English 4 Jul 84 p 6

[Text]

LONDON — A British specialist in military affairs says it has to be assumed that South Africa, Israel and India all have small nuclear arsenals, with that of Israel "probably being the most sophisticated".

In his authoritative new book entitled "Guide to Nuclear Weapons: 1984 - 1985", Dr Paul Rogers also calls attention to suggestions that South Africa is linked with Israel in the development of nuclear weapons.

He observes: "Speculation along these lines increased during and after the (late) South African Prime Minister, Mr John Vorster, visited Israel in 1976.

"Certainly, South Africa maintains close links with Israel in non-military nuclear matters."

Noted as a commentator on contemporary weapons development and on the strategic policies of major powers, Dr Rogers is an academic who teaches at the University of Bradford School of Peace Studies.

His book is the most comprehensive anthology of information about the world's nuclear arsenals.

It is compiled once every two years from hundreds of sources — research centres, international institutes, technical and general journals and governments throughout the world.

"Although there is no conclusive evidence," Dr Rogers

writes, "several factors support the view that South Africa has had a nuclear weapons capability for two or three years."

The factors he cites include those of satellite observation and technical deduction:

● He recalls separate Soviet and American sky scans, which in 1977 suggested to both countries that preparations for a nuclear test-blast were taking place in the Kalahari.

PRESSURE

"There is evidence to suggest that South Africa was then subjected to strong diplomatic pressure from the Carter Administration in the United States, together with the governments of the United Kingdom, France, West Germany and the Soviet Union.

"As a result of this pressure, no test was recorded as taking place — but South Africa did not allow international inspection of the 'test site'."

● Dr Rogers relates the incident in the South Atlantic two years later, when an American high altitude satellite recorded radiation emissions consistent with two to four kiloton nuclear detonation.

Later, American and United Nations scientific assessments differed as to whether the event was in fact a nuclear explosion.

The world body cited evidence that a South African naval task force had been in the area at the time.

● Dr Rogers points out that South Africa "is theoretically capable of following either the plutonium or uranium routes to nuclear weapons".

But, he says, there are limitations on the plutonium route, because the Pelindaba reactors and the Koeberg plant are all covered by safeguards agreements with the Americans, the French or the Vienna-based International Atomic Energy agency.

He suggests that South Africa, which has an annual production of about 8 000 tons of uranium — or 22 percent of the non-communist world's total — is in a position to use that route towards entry into the nuclear weapons league.

UNIQUE

With its unique uranium enrichment process — under way since 1970 at the Valindaba plant — South Africa "could have produced sufficient ma-

terial for at least one bomb by August, 1977, and perhaps eight bombs by the end of 1980", according to a United Nations estimate quoted by Dr Rogers.

On the possibilities of a South African link-up with Israel in nuclear weapons development, Dr Rogers offers few precise details.

He points out that collaboration has taken place in the production and provision of certain missiles which could be used as delivery vehicles.

Specifically, he claims that the Israelis have sold numbers of their Gabriel MK II missile to the Republic.

This 3,3 m long rocket, with a wingspan of about 1,5 m, has a range of about 35 km and a speed of 844 km/h.

It can carry a 99 kg warhead, and can be air or sea launched.

He also says that under an agreement between the two countries, South Africa has produced the Skerpioen missile, modelled on the Israeli Gabriel.

CSO: 5100/48

PETROSYANTS ON NUCLEAR NONPROLIFERATION PROBLEMS

Moscow PRAVDA in Russian 12 Jun 84 First Edition p 4

[Article by A. Petrosyants, chairman of the USSR State Committee for the Utilization of Atomic Energy: "Using the Atom To Create. Strengthening the Nuclear Nonproliferation Setup"]

[Text] This June sees the 30th anniversary of the startup of the world's first atomic power station in the USSR, in the city of Obninsk. Since then more than 40 power reactors with a total capacity of over 22 million kilowatts have been constructed and are operating successfully in our country.

The Soviet nuclear power industry leads the world in a number of indicators. The USSR is the only country in the world to have in operation three nuclear power stations with fast breeder reactors, including the BN-600 reactor--the most powerful installation of this type in the world. Late last year the first phase of the Ignalinskaya AES, which has a record unit capacity of 1.5 million kilowatts, started up. Nuclear power stations are being constructed to provide heat for Gorkiy and Vorenezh. Our country is the only one to have been using ships with nuclear-powered engines in the Arctic Ocean successfully and greatly to the benefit of the national economy over a period of many years.

The peaceful use of nuclear power has been considerably developed abroad too. By the end of 1983 there were around 320 nuclear reactors with a total capacity of the order of 200 million kilowatts operating in 25 countries. This is around 8 percent of the total capacity of all the world's power stations. This indicator is expected to rise to 17 percent by 1985.

Nuclear methods are being applied on an increasing scale and with increasing effectiveness in industry, agriculture, medicine and so forth. In fact, it would be difficult to name an area of the natural sciences, technology, or production in which nuclear energy is not used in one form or another. It will be used on a more extensive scale in the future.

At the same time, the extensive use of nuclear energy is causing a buildup of nuclear material, scientific knowledge, and production experience in a growing number of countries which might potentially be used to manufacture nuclear weapons. And the appearance of nuclear weapons in one or several

states that do not have them at present could lead to a chain reaction of proliferation, increasing the danger of the outbreak of a nuclear war many times over and considerably hampering the achievement of an accord on halting the nuclear arms race and reducing them. This sequence of events would have a most adverse and unpredictable effect on international cooperation in the sphere of peaceful use of nuclear energy.

For that reason many countries, above all the Soviet Union and the other socialist community states, are actively and consistently advocating the strengthening of the nuclear weapons nonproliferation setup. This has acquired special importance of late, what with the abrupt deterioration of the international situation as a result of actions by imperialist circles in the United States and its allies.

In this light the further strengthening of the treaty on the nonproliferation of nuclear weapons--the foundation of the entire nonproliferation setup--is of very great importance. The treaty came into effect in March 1970 and it is currently the broadest agreement in the arms limitation sphere in terms of participants--it now covers 120 states.

At the same time, around 40 countries, including 2 nuclear powers--namely France and China--remain outside the treaty. They include also around a dozen countries which do not have nuclear weapons but which possess the scientific, technical, and production potential to create an explosive nuclear device pretty quickly if they so decide. If these countries were to add their names to the nonproliferation treaty it would be the most convincing evidence of their devotion to the cause of eliminating the threat of nuclear war, the interests of international security, and the strengthening of trust between the peoples.

Israel and South Africa, with U.S. backing and assistance, are essentially making no secret of their nuclear ambitions and are creating extremely adverse conditions for the nonproliferation process, particularly in the Near East and southern Africa. The world public is gravely concerned about recent reports on work to create a nuclear potential in Pakistan. For example, one is bound to react warily to Pakistan's obstinate wish to set up enterprises for the so-called "sensitive" phases of the nuclear fuel cycle although this is not necessitated by the development of peaceful nuclear energy, at least at the present state. According to foreign news media, Pakistan is carrying out the construction and stage-by-stage commissioning of a uranium enrichment plant in (Kakhuta) and a plant to process spent nuclear fuel and extract plutonium is being created in Rawalpindi.

In these conditions it is the duty of all states that are really interested in strengthening the nonproliferation setup to make the maximum effort to involve in the nonproliferation treaty those countries which for one reason or another have not endorsed it and to make the treaty universal.

The system of control (guarantees) by the IAEA is an important element of the nuclear nonproliferation setup. Many years' experience shows that the IAEA's control activity has been carried out with respect for states'

sovereign rights and has not hindered their economic and scientific and technical development or their international cooperation in peaceful nuclear activity. For a number of years now the IAEA has published annual reports on the operation of the guarantees, containing extensive information on the practical results of control activity, analyzing its effectiveness, examining the problems that exist in the field, and giving recommendations on the further improvement of guarantees. It emerges from the reports that control is becoming increasingly effective. And the agency is focusing its efforts on checking the installations that are the most important from the viewpoint of nonproliferation of nuclear weapons.

The IAEA's system of guarantees is now a widely acknowledged, unique international control system. As the product of an accord among a wide range of states, it has shown that given goodwill it is possible to agree on similar measures in other spheres where control is needed, for example, in the field of disarmament and the banning of nuclear weapon tests, thereby ensuring the world community's high confidence in states' observance of their pledges.

The regulation of the export of nuclear materials equipment and technology also serves to strengthen the nonproliferation setup and create favorable conditions for developing the peaceful use of nuclear power. Experience shows that it is most beneficial when its basic terms are agreed on and observed on a broad international basis.

Even now one is quite justified in talking about the positive significance of the "guiding principles for nuclear exports" which were adopted and put into practice in 1978 and are followed by the vast majority of countries participating in world nuclear trade.

In a number of countries these principles now form the basis of corresponding national legislation. The Soviet Union has also laid down the conditions and procedure for exports of nuclear materials, equipment, technology, and services to nonnuclear countries for peaceful purposes. In this way the main conditions associated with the nonproliferation of nuclear weapons are being observed, fully in accordance with our country's commitments under international treaties and accords. While being primarily a guide to practical activity for the relevant Soviet departments and organizations, the procedure that has been adopted can, at the same time, serve as a reliable guide for our country's partners in the sphere of peaceful nuclear cooperation and trade.

The regulation of international exchange of nuclear materials, equipment and technology can be further developed as a result of the activity of the committee for guaranteed supplies set up by the IAEA Board of Governors in 1980. The committee still has much to do to find solutions to a number of important and difficult questions. It should be borne in mind that the committee will be considered to have done a good job if it brings about the further development of equitable and reliable international cooperation in the nuclear energy sphere on the absolute condition that the nuclear nonproliferation setup is further strengthened.

Practice convincingly shows that the existing agreed international measures on control of nuclear exports in no way hinder the extensive application of the achievements of nuclear science and technology, and that includes their use of them in the developing countries. On the contrary, they create conditions for the development of fruitful cooperation between states. If these measures create any obstacles at all, they are in the path of those who want to use international nuclear exchanges in order to be able to create nuclear weapons. Attempts to explain demands for the removal or relaxation of international control of the use of nuclear energy by saying that this control hampers the free use of the achievements of nuclear science and technology are far-fetched and groundless.

If you take a realistic view of the situation, it is perfectly clear that international exchanges in the sphere of peaceful use of nuclear energy are not only and not so much a commercial question as a political question, a question of countries' security, a question of maintaining world peace. Naturally, these links can only be developed if there are effective guarantees that they will not be a channel for the proliferation of nuclear weapons.

The Soviet Union is involved in extensive cooperation with other countries in the sphere of peaceful use of nuclear energy. In most cases this cooperation is being implemented on the basis of bilateral intergovernmental agreements and includes the construction of nuclear power stations, the creation of research centers and installations, the provision of uranium enrichment services, the conduct of joint research, and so forth. Moreover, cooperation is taking place with a number of countries on the basis of commercial contracts. There has never been a case where a Soviet foreign trade organization has refused to hold talks on the delivery to other countries of materials and equipment which the USSR has at its disposal for export purposes.

Measures to implement certain elements of the nuclear fuel cycle on an international basis would be of special significance in terms of strengthening the nonproliferation setup and developing international cooperation. Recent years have seen active work on the elaboration of such measures under the aegis or with the active involvement of the IAEA. This applies above all to the concept of nuclear fuel cycle regional centers which for many countries would be the solution to the problems of reliable, long-term supplies of nuclear fuel and facilities for storage and processing and so forth, while at the same time reliably ensuring conditions for the nonproliferation of nuclear weapons. On more than one occasion the Soviet Union has expressed support for the creation of such centers under IAEA control, and it is prepared to give assistance using the experience it has accumulated and its existing technical potential.

The third conference to examine the effect of nonproliferation treaty, to be held in 1985, will be an important step on the path of the development of the nonproliferation setup.

In today's difficult international situation all the states which really want to ease the threat of nuclear war, strengthen trust among the peoples, and create favorable conditions for the further development of international cooperation in the use of nuclear energy for creative purposes are called upon to contribute in every way to strengthening the nonproliferation setup and, above all, its foundation--the treaty on the nonproliferation of nuclear weapons.

CSO: 5100/4F

EXCERPTS FROM 1982 CEA ANNUAL REPORT

Paris RAPPORT ANNUEL 1982 CEA in French 1982 pp 37, 44, 45

/Excerpt/ The year 1982 was one of consolidation after the important steps taken in the field of nuclear fuel fabrication during the previous 2 years. These steps were, on the one hand, acquisition of the assets of the Nuclear Fuel Industrial Co (SICN), which specializes in fabricating fuels for the natural uranium, graphite, gas sector and, on the other hand, the creation of two firms, CFC /Cogema Framatome Combustible/ and Framema, as equal partners with Framatome. CFC is responsible for fabrication and Framema for marketing of fuels for light-water power plants.

Construction of the CFC fabrication plant was actively pursued and its completion schedule was kept despite a labor dispute that arose during the year.

Framema quickly established itself in the marketing of fuel for pressurized light-water power plants and is now the leading world supplier of this product (830 tons in 1982).

Further, an important part of the activity of the "nuclear fuel" branch of Cogema was devoted to coordination and followup of fabrication of the first fueling of the Superphenix power plant, and to preparation to fill the orders for the next two refuelings. Further, charging of the false core was completed at the beginning of 1982.

Finally, study of a plan for a plant to fabricate fuels for breeder reactors (Project FOR /Fast Oxides Fabrication/) was pursued throughout the year and the cost of this unit was better determined.

The Marcoule plant reprocesses spent fuel for the UNGG /natural uranium, graphite, gas/ sector. The La Hague plant alternately reprocesses fuel from light-water reactors, UNGG reactors and the Phenix fast breeder reactor. La Hague reprocessed fuels from the Fessenheim reactor of the EDF /French Electric Power Co/ for the first time in 1982.

Operation of these two plants was satisfactory during the entire year and the planned programs were carried out.

Cogema investments were heaviest in this field. Essentially, they comprised an increase in the capacity of the La Hague plant, which is to be brought to 1,600 tons a year by 1990. This program, whose total cost will exceed 20 billion in 1981 francs, absorbed 1.45 million francs in 1982 alone, or about two-thirds of the total investments of Cogema.

The work done in 1982 related mainly to a new plutonium storage building, the new effluent treating station, the shop for vitrification of fission products and a second large-capacity irradiated fuel storage pool. The exceptional size of this project required setting up a large construction site (shown in photo) /photo not reproduced/.

Moreover, the considerable increase in plant capacity led to setting up new railroad terminal at Valognes to handle trains carrying irradiated fuel.

Note should also be taken of a new irradiated fuel receiving, storage and decladding unit (MAR 400) being built at Marcoule.

Finally, development of the worldwide nuclear program and signing of reprocessing contracts with foreign electric power producers have led to considerable development of shipping of irradiated fuel. To handle maritime shipping of this type of fuel from Swedish power plants, Sofrasam, a Franco-Swedish company, was created to build and operate a specialized ship, the Sigyn, which was christened on 10 September.

Uranium-graphite-gas Reactors

The UNGG [natural uranium, graphite-gas] sector represents 1960 MWe installed, to which should be added the Vandellós reactor of 480 MWe, whose neutron and thermal tracking is provided by the CEA /Atomic Energy Commission/. These reactors produced 9 percent of French electric power of nuclear origin (including 25 percent from Vandellós) in 1982.

The CEA provides technical tracking of these installations and participates in the definition of their operating conditions, particularly for that concerning observance of the limits for use of fuels (temperatures, specific burnup). These fuels, fabricated by Cogema, are as reliable as ever. The failure rate of the graphite core elements is less than 1.5 per 100,000 for a maximum specific burnup of 6,500 MWd/t and is equal to 4/100,000 for the annular elements whose maximum irradiation is 6,000 MWd/t.

Other CEA activities include technical assistance to EDF /French Electric Power Co/, Cogema and Hifrensa operators to help them face problems that arise, whose number and importance increase with the age of the reactors. The oldest, G3, is actually 22 years old and the most recent, Vandellós and Bugey 1, marked their 10th anniversary this year.

The major problem is corrosion of steels by hot carbon dioxide. To remedy it, servicing for Bugey 1 and Chinon A3 reactors by laser cutting has been or is being studied. This modern tool seems promising for numerous dismantling applications for which the UNGG reactors will be the precursors.

SWITZERLAND

UPCOMING REFERENDUM ON NUCLEAR POWER, SAVING ENERGY

Vienna DIE PRESSE in German 7 Jun 84 supplement p X

[Article by Peter Amstutz: "Energy Policy at Crossroads: Pro and Con Nuclear Energy"]

[Text] During the weeks of the "petroleum crisis" in the fall of 1973 when private motor vehicle traffic had to cease on three Sundays so that the Swiss storage depots would not be depleted too fast the Swiss awoke. "The times are unfortunately over," said the then transportation and energy minister, Bundesrat Willi Ritschard to the nation, "when a government could look at events in the energy sector from the sidelines, all at peace, and when it had as its main function the counting of kilowatt hours. We have ended up deep in the field of political tensions and conflicts."

That is where the Swiss still are, 10 years later. But the international political conditions affecting national energy supply were joined by internal political battles over the "correct" prescription for the future. In reaction to the supply crisis of 1973 the government appointed a "Confederate commission for comprehensive energy concept (GEK) as a consulting body. It was to recommend how Bern could devise the constitutional and the subsequent legislative measures that were needed to develop an all-Swiss energy policy. After processing of some 1,800 pages of expert reports in both chambers of the Swiss parliament (National Council and Professional Council) and examination of a government "Message regarding the Basic Questions of Energy Policy" of 25 March 1981, came the test.

The approximately 3.8 million voting citizens were called upon to decide the adoption or rejection of the following text amendment to the federal constitution: "The federation can establish principles to secure an adequate, economical, and ecologically sound energy supply regarding conservative and rational energy consumption. It can issue regulations regarding energy use of plants, vehicles and instruments, support development of technologies that foster conservative and rational energy use, utilization of new energies, and the broad diversification of energy supply." There was a desire to change the energy dependence on world supply. For the Swiss depend up to 40 percent on liquid fuels, 27 percent on liquid propellants, 19 percent on electricity, 6 percent on gas, 3 percent on coal, less than 2 percent on wood and the negligible rest includes thermal energy, industrial byproducts, as well as new energy sources (solar energy, thermal energy, biogas).

The parliamentary amendment split the nation. Some say that this is thin soup, it will be of no use, Bern is intervening much too gingerly. "State interventionism," complained others, things have gone rather well up to now without government intervention, and what is to become of federalism based on the responsibility of 26 cantons? The result of the plebiscite reflected this: With 649,466 for and 626,002 against a small majority of the people rallied behind the federal draft, but the amendment failed in the cantons. Changes of the constitution must always be supported also within the individual cantons so that a total affirmative majority of "people and stands" is obtained.

Even on the evening of the defeat, on 27 February 1983, the new energy minister, Leon Schlumpf declared that the defeat did not relieve the federation from its obligation to discharge its political duties and to strive for "securing of an adequate, economical and environmentally benign energy supply." But how? In the meantime the politicians had been put on the defensive. The nationally very controversial, locally completely rejected construction project for a nuclear power plant at Kaiseraugst near Basel awoke new forces that were thought not to have existed. Under the leadership of the Swiss energy foundation some 50 organizations within the "anti-nuclear and environmental protectors" collected signatures for their cause. Since in Switzerland every voter can, with the support of at least 100,000 signatures of sympathizing fellow citizens, submit proposals to amend or change the constitution which then have to be weighed by government, parliament, and the people as final authority, they submitted texts about a "Switzerland without nuclear energy" that landed on the Bundesrat tables. There is a dual proposal. "The people's initiative on a secure, economical, and environmentally justifiable energy supply" want to show the way "to a genuine reordering" through rigorous mandatory conservation and taxation of all "over-consumption" while "the people's initiative for a future without more nuclear energy plants" offers a basis for the prohibition of new and demolition of existing nuclear plants. The proposals for a totally different Swiss energy policy advanced by left and green circles with an almost sectarian one-sidedness foundered in the government--"An excessive stress on environmental aspects instead of an equal consideration of the aims regarding 'secure supply, economy, and environmental protection' should be rejected. Energy policy must not be used as a means for socio-political changes." And the Bundesrat had this to say about the nuclear prohibition initiative on 1 June 1983: "If all major new plants are blocked, shortages in electricity supply with incalculable consequences can occur." The parliamentary chambers joined in this evaluation and submitted the initiatives to the people, recommending their rejection. The die will be cast at the polls on 23 September of this year.

The initial situation points to a hot autumn becomes understandable when one the term "Kaiseraugst." A majority yea to the nuclear plant-nay will make this billion-project cause for compensation proceedings in federal courts. On the other hand, a nay would mean approval by the nation for that location which is rejected out of hand and fought even by the governments of the concerned cantons, Basel Stadt and Basel Laudshaft. The result would be an internal political test of strength, a confederate splitting test. But a national nay in the nuclear energy field will not be an ideal solution--this would mean that the confederation would be forever maneuvered away from modern supply technologies into a corner where it could exist for any length of time only with state-mandated energy conservation. The citizens are standing on the crossroads, the authorities are fearfully eyeing the overdue decisions.

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